

WHAT IS CLAIMED IS:

1 1. A method comprising:
2 monitoring a variable-rate data communication
3 channel to determine its signal-to-noise ratio; and
4 adjusting the data transmission rate of the variable
5 rate data communication channel based on its signal-to-
6 noise ratio.

1 2. The method of claim 1 wherein said adjusting the data
2 transmission rate includes comparing the signal-to-noise ratio
3 of the variable rate data communication channel to a plurality
4 of signal-to-noise ratio ranges.

1 3. The method of claim 2 wherein said adjusting the data
2 transmission rate further includes selecting the signal-to-
3 noise ratio range that encompasses the signal-to-noise ratio
4 of the variable rate data communication channel.

1 4. The method of claim 3 wherein each signal-to-noise ratio
2 range is associated with a specific data transmission rate,
3 said adjusting the data transmission rate further includes
4 setting the data transmission rate of the variable rate data
5 communication channel to the specific data transmission rate
6 associated with the selected signal-to-noise ratio range.

1 5. The method of claim 1 wherein the variable rate data
2 communication channel is a bidirectional channel that includes
3 a receive side for receiving data from a remote device and a
4 transmit side for transmitting data to that remote device,
5 said monitoring a variable-rate data communication channel
6 includes determining a noise signal strength factor for the

7 receive side of the variable-rate data communication channel
8 during a non-transmission period.

1 6. The method of claim 5 wherein monitoring a variable-rate
2 data communication channel includes determining a received
3 signal strength factor for the receive side of the variable-
4 rate data communication during a transmission period.

1 7. The method of claim 6 wherein monitoring a variable-rate
2 data communication channel includes determining the difference
3 between the received signal strength factor and the noise
4 signal strength factor, wherein the difference is a data
5 signal strength factor.

1 8. The method of claim 6 wherein monitoring a variable-rate
2 data communication channel includes determining the signal-to-
3 noise ratio of the variable-rate data communication channel
4 from the data signal strength factor and the noise signal
5 strength factor.

1 9. The method of claim 1 further comprising iteratively
2 adjusting the data transmission rate of the variable rate data
3 communication channel if the signal-to-noise ratio of the
4 channel cannot be determined for a defined period of time.

1 10. A data transmission rate control process comprising:
2 an SNR determination process for monitoring a
3 variable-rate data communication channel to determine its
4 signal-to-noise ratio; and
5 a transmission rate adjustment process, responsive
6 to said SNR determination process, for adjusting the data
7 transmission rate of said variable rate data
8 communication channel based on its signal-to-noise ratio.

1 11. The data transmission rate control process of claim 10
2 wherein said transmission rate adjustment process includes an
3 SNR comparison process for comparing the signal-to-noise ratio
4 of the variable rate data communication channel to a plurality
5 of signal-to-noise ratio ranges.

1 12. The data transmission rate control process of claim 11
2 wherein said transmission rate adjustment process further
3 includes a range selection process for selecting a signal-to-
4 noise ratio range that encompasses the signal-to-noise ratio
5 of the variable rate data communication channel.

1 13. The data transmission rate control process of claim 12
2 wherein each said signal-to-noise ratio range is associated
3 with a specific data transmission rate, said transmission rate
4 adjustment process further including a transmission rate
5 selection process for setting the data transmission rate of
6 said variable rate data communication channel to the specific
7 data transmission rate associated with the selected signal-to-
8 noise ratio range.

1 14. The data transmission rate control process of claim 10
2 wherein said variable rate data communication channel is a
3 bidirectional channel that includes a receive side for
4 receiving data from a remote device and a transmit side for
5 transmitting data to that remote device, said SNR
6 determination process including a noise signal determination
7 process for determining a noise signal strength factor for
8 said receive side of said variable-rate data communication
9 channel during a non-transmission period.

1 15. The data transmission rate control process of claim 14
2 wherein said SNR determination process includes a received
3 signal determination process for determining a received signal
4 strength factor for said receive side of said variable-rate
5 data communication channel during a transmission period.

1 16. The data transmission rate control process of claim 15
2 wherein said SNR determination process includes a data signal
3 determination process for determining the difference between
4 said received signal strength factor and said noise signal
5 strength factor, wherein said difference is a data signal
6 strength factor.

1 17. The data transmission rate control process of claim 16
2 wherein said SNR determination process includes a SNR
3 calculation process for determining said signal-to-noise ratio
4 of said variable-rate data communication channel from said
5 actual signal strength factor and said noise signal strength
6 factor.

1 18. The data transmission rate control process of claim 10
2 further comprising an iterative rate determination process,
3 responsive to said SNR determination process being unable to
4 determine the signal-to-noise ratio of said variable-rate data
5 communication channel for a defined period of time, for
6 setting the data transmission rate of said variable rate data
7 communication channel.

1 19. The data transmission rate control process of claim 18
2 wherein said variable-rate data communication channel can
3 transmit data at a plurality of data transmission rates, said
4 iterative rate determination process including an initial rate
5 setting process for setting the data transmission rate of said
6 variable-rate data communication channel to the data
7 transmission rate that corresponds to the last-determined
8 signal-to-noise ratio.

1 20. The data transmission rate control process of claim 19
2 wherein said iterative rate determination process includes:
3 a data transmission process for transmitting data
4 packets, via said variable-rate data communication
5 channel, to a remote device; and
6 a receipt confirmation process for determining if
7 said data packets transmitted to said remote device were
8 received by said remote device.

1 21. The data transmission rate control process of claim 20
2 wherein said iterative rate determination process includes a
3 transmission ratio determination process for determining a
4 transmission ratio, wherein said transmission ratio is

5 indicative of the ratio of data packets received by the remote
6 device versus data packets transmitted to the remote device.

1 22. The data transmission rate control process of claim 21
2 wherein said iterative rate determination process includes:

3 a transmission ratio comparison process for
4 comparing said transmission ratio to a defined
5 acceptability ratio range; and

6 a transmission rate adjustment process for adjusting
7 the transmission rate of said variable-rate data
8 communication channel in response to said transmission
9 ratio being outside of said defined acceptability ratio
10 range.

1 23. A computer program product residing on a computer
2 readable medium having instructions stored thereon which, when
3 executed by the processor, cause that processor to:

4 monitor a variable-rate data communication channel
5 to determine its signal-to-noise ratio; and

6 adjust the data transmission rate of the variable
7 rate data communication channel based on its signal-to-
8 noise ratio.

1 24. The computer program product of claim 23 wherein said
2 computer readable medium is a read-only memory.

- 1 25. A data transmission rate control system comprising:
2 a first computing device including a first wireless
3 communication system;
4 a second computing device including a second
5 wireless communication system, wherein said first and
6 second wireless communication systems form a variable
7 rate data communication channel between said first and
8 second computing devices;
9 wherein each said wireless communication system
10 includes:
11 a SNR determination process for monitoring said
12 variable-rate data communication channel to
13 determine its signal-to-noise ratio; and
14 a transmission rate adjustment process,
15 responsive to said SNR determination process, for
16 adjusting the data transmission rate of said
17 variable rate data communication channel based on
18 its signal-to-noise ratio.
- 1 26. The data transmission rate control system of claim 25
2 wherein said transmission rate adjustment process includes:
3 a SNR comparison process for comparing the signal-
4 to-noise ratio of said variable rate data communication
5 channel to a plurality of signal-to-noise ratio ranges;
6 and
7 a range selection process for selecting a signal-to-
8 noise ratio range that encompasses the signal-to-noise
9 ratio of said variable rate data communication channel.
- 1 27. The data transmission rate control system of claim 26
2 wherein each said signal-to-noise ratio range is associated

3 with a specific data transmission rate, said transmission rate
4 adjustment process further including a transmission rate
5 selection process for setting the data transmission rate of
6 said variable rate data communication channel to the specific
7 data transmission rate associated with the selected signal-to-
8 noise ratio range.

1 28. The data transmission rate control system of claim 27
2 wherein said variable rate data communication channel is a
3 bidirectional channel that includes a receive side for
4 receiving data from a remote device and a transmit side for
5 transmitting data to that remote device, said SNR
6 determination process including a noise signal determination
7 process for determining a noise signal strength factor for
8 said receive side of said variable-rate data communication
9 channel during a non-transmission period.

1 29. The data transmission rate control system of claim 28
2 wherein said SNR determination process includes:

3 a received signal determination process for
4 determining a received signal strength factor for said
5 receive side of said variable-rate data communication
6 channel during a transmission period; and

7 a data signal determination process for determining
8 the difference between said received signal strength
9 factor and said noise signal strength factor, wherein
10 said difference is a data signal strength factor.

1 30. The data transmission rate control system of claim 29
2 wherein said SNR determination process includes an SNR
3 calculation process for determining said signal-to-noise ratio
4 of said variable-rate data communication channel from said

- 5 actual signal strength factor and said noise signal strength
- 6 factor.

2025 RELEASE UNDER E.O. 14176